

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-17. (Cancelled).

18. (Currently Amended) Magnetic device comprising a spin valve, said spin valve (110) comprising a plurality of layers (111, 112, 113, 114, 115, 116, 117) arranged in a stack which in turn comprises at least one free magnetic layer (111) able to be associated to a temporary magnetisation (MT), a spacer layer (113; 133) and a permanent magnetic layer (112) associated to a permanent magnetisation (MP), ~~wherein characterised in that~~ said spacer element (133) is obtained according to a method the step of manufacturing a magnetoresistive element (10; 20) comprising regions having metallic conduction (13; 23) and regions having semi-conductive conduction (11; 31) wherein said method comprises the following operations:

- forming metallic nanoparticles (37) to obtain said regions with metallic conduction (13; 23);
- providing a semiconductor substrate (31);
- applying said metallic nanoparticles (37) to said semiconductor substrate (31) to obtain  
a disordered mesoscopic structure included in the method as claimed in claim 1.

19. (Currently Amended) Device as claimed in claim 18, ~~wherein characterised in that~~ said spacer element (133) comprises a matrix (135) and nanoparticles (134).

20. (Currently Amended) Device as claimed in claim 19, ~~wherein characterised in that~~ said matrix (135) is a matrix of dielectric material.

21. (Currently Amended) A device as claimed in claim 18, ~~wherein characterised in that~~ said matrix (135) comprises a porous dielectric material, in particular porous alumina or porous

silicon, and the nanoparticles (134) are contained in pores (136) of said porous dielectric material.

22. (Currently Amended) Device as claimed in claim 18, ~~wherein characterised in that it~~ is configured to regulate its electrical properties through the composition of said spacer layer (133).

23. (Currently Amended) Device as claimed in claim 18, ~~wherein characterised in that it~~ is employed in TMR applications.

24. (New) A method for manufacturing magnetic devices including at least a spin valve (110) comprising a plurality of layers (111, 112, 113, 114, 115, 116, 117) arranged in a stack which in turn comprises at least one free magnetic layer (111) able to be associated to a temporary magnetisation (MT), a spacer layer (113; 133) and a permanent magnetic layer (112) associated to a permanent magnetisation (MP), said method comprising the operations of manufacturing said spacer layer (113; 133) as a magneto-resistive element (10; 20) comprising regions having metallic conduction (13; 23) and dielectric regions or regions having semi-conductive conduction (11; 31) said method comprising the following operations:

- forming metallic nanoparticles (37) to obtain said regions with metallic conduction (13; 23) of said spacer layer (113; 133);
- providing a semiconductor or dielectric substrate (31);
- applying said metallic nanoparticles (37) to said semiconductor or dielectric substrate (31) to obtain a disordered mesoscopic structure wherein said semiconductor or dielectric substrate (31) is subjected to a chemical etching process to form pores (22) in said semiconductor substrate (31).

25. (New) Method as claimed in claim 24 wherein said metallic nanoparticles (37) are applied to said semiconductor or dielectric substrate, introducing said nanoparticles (37) in a solution (40) and applying said solution (40) to said substrate (31).

26. (New) Method as claimed in claim 25, wherein it is employed in a process of capillary condensation of said solution (40) in the pores (22) of said semiconductor or dielectric substrate (31) to obtain said metallic regions (23).

27. (New) Method as claimed in claim 25, wherein it is employed in a process of electrochemical deposition in the pores (22) of said semiconductor or dielectric substrate (31) to obtain said metallic regions (23).

28. (New) Method as claimed in claim 24, wherein a porous template is applied to perform said chemical etching process of the semiconductor or dielectric substrate (31), to said substrate (31).

29. (New) Method as claimed in claim 28, wherein said porous template (38) is a template of porous alumina.

30. (New) Method as claimed in claim 26, wherein said chemical etching uses an electrolytic solution (32) able to etch said semiconductor or dielectric substrate (31) and that said electrochemical solution (32) is progressively replaced by the solution (40) containing metallic nanoparticles (37) always leaving the surface of the semiconductor or dielectric substrate (31) immersed, to prevent ambient air or gas from penetrating in said pores (22).

31. (New) A method as claimed in claim 24, wherein it further comprises a step of thermal annealing of said magnetoresistive element (20) to create nanorods in said pores (22).

32. (New) Method as claimed in claim 24, wherein in said step of providing a semiconductor or dielectric substrate, said substrate (31) is grown with a growth process and the

step of applying said metallic nanoparticles (37) provides for co-evaporating said particles (37) during said process of growing said substrate (31).

33. (New) Method as claimed in claim 32, wherein said growth process is a sputtering process.

34. (New) Method as claimed in claim 32, wherein said growth process is a Chemical Vapour Deposition process.

35. (New) Method as claimed in claim 24, wherein said substrate of semiconductor material (31) is obtained by means of a semiconductor selected among silicon, germanium, indium antimonide, mercury telluride, indium arsenide, carbon titanate, gallium arsenide, silicon carbide, gallium phosphide, gallium nitride and alumina.

36. (New) Method as claimed in claim 24, wherein said metallic nanoparticles (37) are of a metallic material selected among gold, silver, aluminium, gallium, indium, copper, chrome, tin, nickel, iron, platinum, palladium, cobalt, tungsten, molybdenum, tantalum, titanium, permalloy.

37. (New) A method as claimed in claim 24, wherein said semiconductor substrate (31) is laid on another insulating substrate.

38. (New) Method as claimed in claim 25, wherein said chemical etching process to form pores (22) in the semiconductor substrate (31) forms through pores (22).

39. (New) Magnetic device comprising a spin valve, said spin valve (110) comprising a plurality of layers (111, 112, 113, 114, 115, 116, 117) arranged in a stack which in turn comprises at least one free magnetic layer (111) able to be associated to a temporary magnetisation (MT), a spacer layer (113; 133) and a permanent magnetic layer (112) associated to a permanent magnetisation (MP), wherein said spacer element (133) is obtained according to

the step of manufacturing a magnetoresistive element (10; 20) included in the method as claimed in claim 24.

40. (New) Device as claimed in claim 39, wherein it is configured to regulate its electrical properties through the composition of said spacer layer (133).

41. (New) Device as claimed in claim 39, wherein it is employed in TMR applications.